

Blawforms for Roads & Streets



BLAW-KNOX

SG-1 1921 955

BLAWFORMS FOR ROADS AND STREETS



*Illustrating and Describing the
Use of Blaw Steel Forms in
the Construction of*

Concrete Roads, Brick Roads,
Bituminous Roads, Curbs,
Combined Curb and Gutter,
Gutters, Integral Curb for
Concrete Pavements,
Sidewalks

BLAW-KNOX COMPANY

GENERAL OFFICES: PITTSBURGH, PA.

DISTRICT SALES OFFICES

NEW YORK
165 Broadway

CHICAGO
Peoples Gas Building

SAN FRANCISCO
Monadnock Building

BOSTON
Little Building

DETROIT
Lincoln Building



"Let me live in a house
by the side of the road
and be a friend of man."

Foreword

WOOD, as a form material, never was ultimately most economical.

Its lower first cost has always been offset by waste, stealth, and extremely high form labor cost.

Blaw Steel Forms, on the other hand, are profitable *equipment*, not wasteful *material*.

Blaw Steel Forms are absolutely essential in the construction of modern roads and streets.

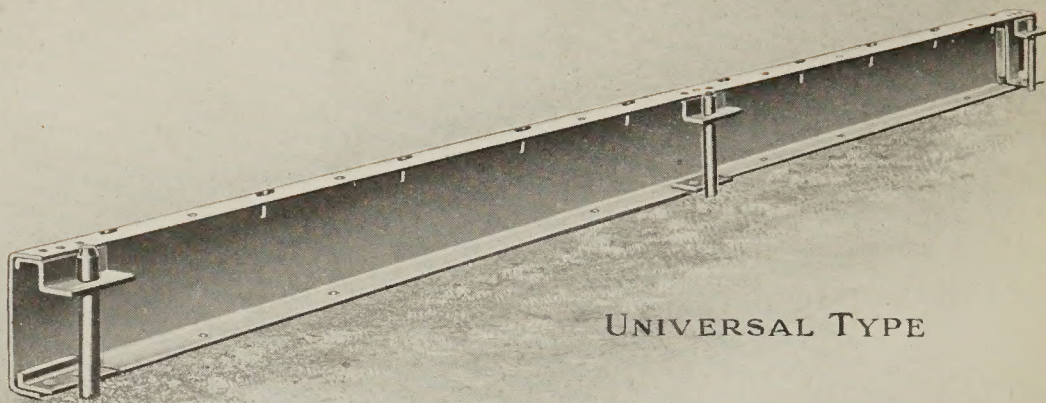
Without them the new methods of mechanical subgrading and finishing would be impractical, or at least extremely uneconomical.

With Blaw Steel Forms it is possible to construct the most intricate designs of curb, curb and gutter, integral curb and pavement, bituminous surfaced road, etc., much more cheaply than in any other way.

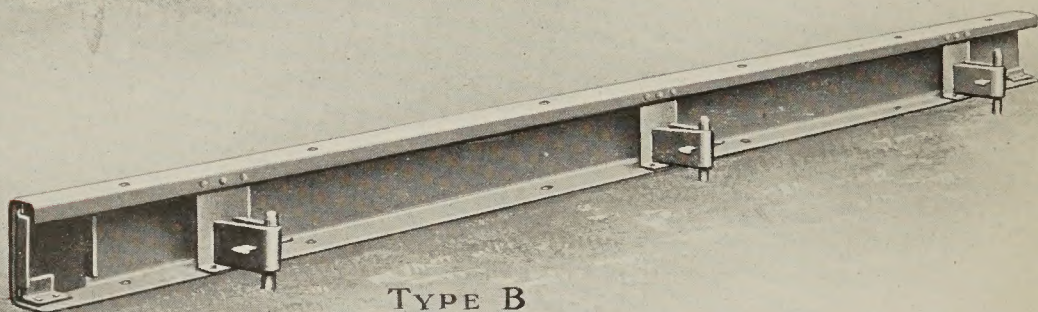
Remember that skilled labor is almost entirely eliminated when you use Blawforms. And that there is a Blaw Steel Form for every type of concrete construction.

Let Blaw form *your* concrete!

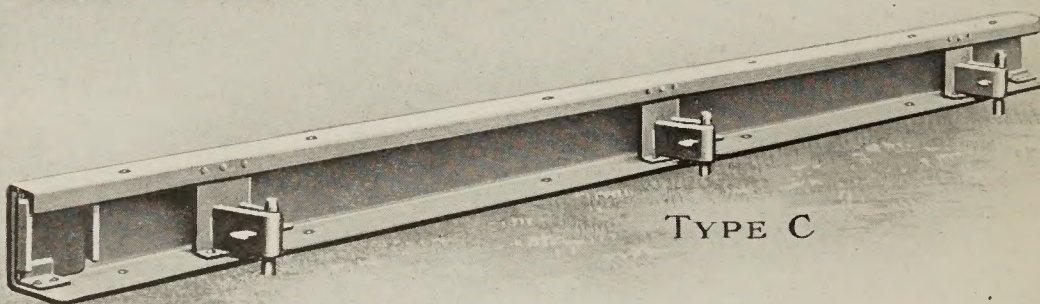
Blawforms for Roads and Streets



UNIVERSAL TYPE

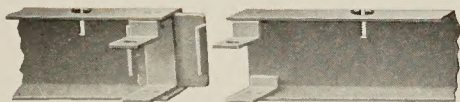


TYPE B

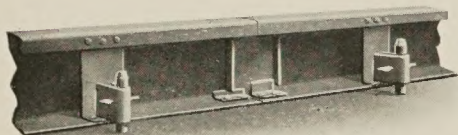


TYPE C

10 Ft. Sections of the Three Types of Blawforms for Roads and Streets



The Blaw Slip-Joint Connection on Universal Forms—Open



The Blaw Slip-Joint Connection on Special Road Forms—Closed

Any section of Blawforms can be removed from the line without disturbing adjacent sections, by unlocking the Slip-Joint Connections holding it in place.

In concrete road construction this feature is invaluable, because the forms can be opened at any point to permit the entrance of trucks or wagons.

Types of Forms

There are three types of Blawforms for road and street construction; viz., the Universal type Forms, and two types of Special Road Forms.

All types are intrinsically the same, and are used on all kinds of road and street construction.

Universal Forms are peculiarly fitted to the needs of the contractor who desires equipment that can be used on all kinds of street work (curb, curb and gutter, gutter, sidewalks, and integral curb for concrete pavements), and for certain kinds of road work (monolithic and sand cushioned brick roads, bituminous and asphalt surfaced roads on concrete base).

Type B Special Road Forms are recommended for the construction of hand, roller, or belt finished concrete roads.

The extra heavy Type C Special Road Forms are a necessity on roads where the subgrading or finishing operations, or both, are accomplished mechanically.

All types are interchangeable, and can be used together without the use of special appliances.

The construction, and the application of these three types of forms to road and street work are described and illustrated in the following pages.

The Blaw Slip-Joint Connection

The patented Blaw Slip-Joint Connection, the means of connecting adjoining forms together and of providing a tight, stiff, and smooth joint, is simply a "slide" which functions much the same as an angle bar on a railroad rail, but has the advantage of being smaller, lighter, and simpler, and is *an integral part of each rail*. There are no loose parts.

This connection *locks* adjoining rails together, positively and securely, and will operate easily and quickly at all times. It is the only practical connection that will withstand the side pressure and tendency to spread developed by finishing and subgrading machines.

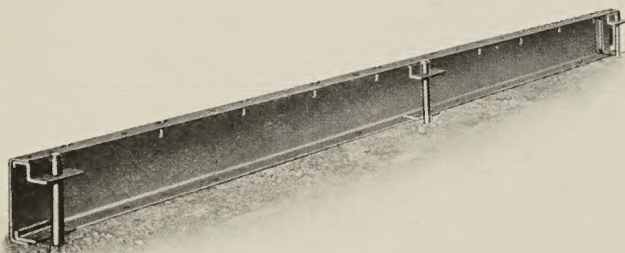
This connection is sufficiently flexible to allow for change of grade or alignment without affecting the rigidity of the joint. An added assurance against any movement is provided by the Blaw System of staking on each side of the joint.



Blawforms for Roads and Streets



Blaw Universal Forms on Brick Paved Concrete Road Construction. Combined Curb and Gutter on the Left, and Integral Curb and Base on the Right



10 Ft. Section of Blaw Universal Forms

Universal Forms are so called, because they are “universal” in application—they are just as adaptable to curb, gutter, combined curb and gutter and integral curb construction, as they are to sidewalk work.

Blaw Universal Forms

The Universal Forms are channel shaped rails, made of special blue annealed open hearth steel plate ($\frac{1}{8}$ " for the smaller sizes, and $\frac{9}{64}$ " for forms 15" in height and over) in various heights from 4" to 24". All rails have flanges (2" wide for rails up to 15" high, and 3" wide for heights over 15") at top and bottom.

Slots spaced 12" apart are provided in the top flange, for dividing plates, so that expansion joints can be made wherever desired. When so ordered, the forms can be furnished "without slots"—this is advisable where the forms are used only for the certain types of road building for which Universal Forms are recommended, as explained on pages 13, 15 and 17.

The standard length is 10 ft. which has been found to be the most economical to handle. Shorter lengths (particularly 5 ft. lengths) are used to take care of short curves. For sharp curves, and where the radius changes frequently, Blaw Flexible Forms, described on page 33, are used. Blaw Radius Forms are used where many repetitions of the same radius are encountered.

Bolt holes are punched in the top and bottom flanges, so that forms of any desired height can be made up by bolting together the proper number of rails, one on top of the other. The height of any form can readily be increased 1" or 2" by simply bolting 1 x 4's or 2 x 4's to the bottom flanges.

The rails are so designed that forms for any shape or width of curb, gutter, combined curb and gutter, sidewalk, or integral curb for concrete pavement and base can be built, requiring only the necessary dividing plates or angle Spacers.

Three stake clips are riveted to the top flange of each 10 ft. section, and are so arranged that the stakes, when properly driven, will not interfere with finishing operations.

Three steel stakes of the proper length are furnished with each 10 ft. section.

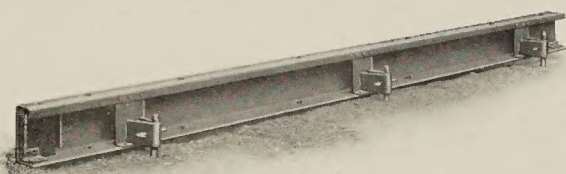
Universal Forms are interchangeable with Special Road Forms, and require no special appliances.



Blawforms for Roads and Streets



Type B Special Road Forms on the Lincoln Highway in Illinois



10 Ft. Section of Type B Blaw Special Road Forms

Blaw Special Road Forms, of either type, assure an unwavering, uniformly smooth road surface, because they are scientifically designed and the top flange is properly reinforced to withstand hard service and ordinary abuse.

Blaw Special Road Forms

Type B Special Road Forms are designed especially for use on concrete roads, and roads having a concrete base, where the finishing is accomplished by belt, roller, or other hand operated devices.

They are practically identical in design and construction with Type C Special Road Forms. The bottom flange is flat, $3\frac{1}{4}$ " wide, designed to give sufficient bearing surface; the top flange is $2\frac{1}{4}$ " wide with a 1" stiffening edge, making a very substantial and absolutely smooth track. Type B Special Road Forms are made of No. 10 gauge blue annealed open hearth steel plate, the 6" size weighing approximately $6\frac{1}{2}$ pounds per foot net, or $7\frac{1}{2}$ pounds per foot including the steel stakes.

Type C (extra heavy) Special Road Forms are extremely strong and heavy, and are used where subgrading or finishing operations, or both, are effected by means of machines.

Type C forms are made of the highest grade No. 9 gauge blue annealed open hearth steel plate, flanged top and bottom and reinforced with heavy plates, the 6" size weighing approximately 7.8 pounds per foot net, or 9 pounds per foot including the stakes.

The bottom flange of Type C Special Road Forms is flat, 4" wide, designed to give great bearing surface; the top flange is $2\frac{1}{2}$ " wide with a $1\frac{1}{8}$ " stiffening edge, making a very substantial and absolutely smooth track.

Three steel stakes of the proper length are furnished with each Special Road Form. These stakes pass through the stake straps which are securely fastened to the reinforcing plates.

The stake straps are slotted to receive tapered keys which *lock* the forms to the stake, securely and positively; this ingenious arrangement ties the forms to the ground, firmly holds them to line and grade, and prevents any movement when machines are being operated. This arrangement also makes possible the supporting of the form against the vibration developed by machines, prevents any oscillation or movement of the forms, and at the same time causes the stake to act like the buttress of a retaining wall, holding the form in position against the overturning action which the machines develop.

The bolt holes in the flanges make it possible to build forms for integral curb and pavement or base, by simply bolting Blaw Universal Forms to the Special Road Forms.

Six-inch forms can be readily converted into 7" or 8" forms by bolting 1 x 4's or 2 x 4's to the bottom flanges, bolt holes being provided for this purpose.

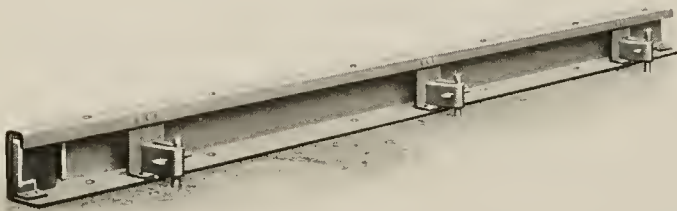
These forms are furnished in various heights, and the standard length is 10 ft., which has been found to be the most economical to handle and to meet the ordinary curvatures encountered in road building. The 10 ft. lengths are used on all curves with radii of 130 ft. or over; 5 ft. lengths are used on curves up to 130 ft. and not below 65 ft. radii.



Blawforms for Roads and Streets



Type C Special Road Forms Under a Finishing Machine on
Lincoln Highway Construction in Pennsylvania



10 Ft. Section of Type C Blaw Special Road Forms

The bottom flange of Type C Special Road Forms is flat, $\frac{1}{4}$ " wide, designed to give great bearing surface; the top flange is $2\frac{1}{2}$ " wide with a $1\frac{1}{8}$ " stiffening edge, making a very substantial and absolutely smooth track.

Blawforms on Concrete Roads

In the construction of the prevailing type of hard surfaced road—the concrete road—either type of Special Road Forms should be used.

The extra heavy Type C Form should be used where mechanical methods of subgrading or finishing are employed. Type B Forms are most economical and serviceable on all belt or roller finished jobs.

Universal Type Forms have been and can be used on hand finished concrete roads, but are not recommended in view of the present rigid specifications which require that forms present an absolutely smooth surface along the top flange (Universal Forms are slotted in order to take dividing plates for curb, curb and gutter, and other similar types of construction, and therefore do not meet this specification completely).

See page 33 regarding the use of Blaw Flexible and Radius Forms.

Engineers throughout the country realize the importance of having a form that will maintain continuously an absolutely smooth surface, and wood forms are therefore being abandoned everywhere, because the roughness and unevenness developed in the top of the wood form is transferred to the surface of the road, causing a bumpy, irregular and very undesirably finished surface.

Where the road is graded or finished mechanically it is of vital importance that the form have sufficient bearing area in the bottom flange to sustain the heavy loads and the oscillation and vibration developed. Blaw Special Road Forms are designed with an extra wide bottom to support these loads uniformly and without any movement or “give” at the joints.

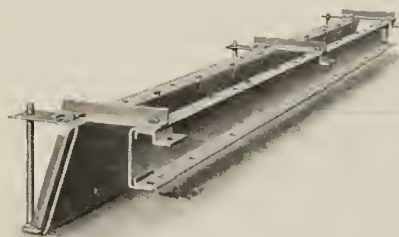
In order to meet the most exacting specifications that may be written, and to insure the engineer and the contractor a form that will withstand the abuses that occur in modern road construction, we have developed a form of special design with reinforced top flange, with three stiffeners in each rail, with a special method of staking, with wide bottom flange that insures uniform bearing along the entire length, with the tight, secure patented Slip-Joint Connection—all of which are embodied in the two types of Blaw Special Road Forms.



Blawforms for Roads and Streets



Blaw Universal Forms on the Butler-Saxonburg, Pa., Sand Cushioned Brick Road



10 Ft. Section of Universal Forms
for Casting Curb Integral with
Base
Note the *Battered Back Form*

Simplicity is the keynote of the Blaw System for building curb integral with the base.

Small Universal Forms, or Blaw Face Forms (usually $4\frac{3}{4}$ " high), suspended and spaced from the back forms by means of "Spacers", provide the simplest yet the most practical forms ever devised for this type of road construction.

Blawforms on Sand Cushioned Brick Roads

Sand cushioned brick roads call for the construction of a curb cast integral with the base. Angle "Spacers" quickly convert Blaw Universal, or Special Road Forms of either type, into the most simple and efficient forms for building integral curb and base for this type of road.

Spacers are made of special steel angles, with one bolt hole in one end, and two notches in the other end. They are furnished, for any width of curb, at a nominal price.

Spacers are used for suspending the face form, and to space that form the proper distance from the back form. These two functions are shown very clearly in the illustrations.



In operation the Spacers are securely fastened to the smaller or face form, and are never removed until the entire job is completed. Bolts are passed through the bolt holes provided in the flanges of all Blawforms and in the one end of all spacers.

After the higher or back forms have been set up, the smaller or face forms are suspended from the former by means of the spacers; one notch is slipped under bolts which have been placed in the bolt holes in the top flanges of the back forms, the other notch fitting around the stakes which hold the back forms in position, after which these bolts are drawn up tight.

To remove the face forms simply loosen (but don't remove) the bolts, and swing back the spacers.

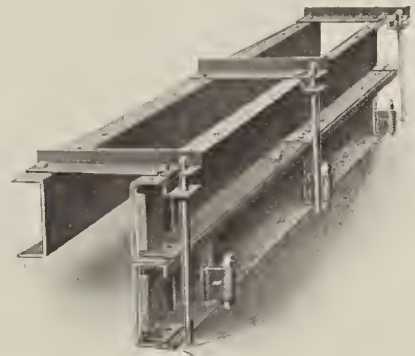
No stakes are used on the face forms; they need no support as they are held level and rigid by the spacers, three of which should be used on every 10 ft. section.

Dividing plates are not necessary, but can be used if specifications call for expansion joints through the curb.

To facilitate the finishing of the curb or curbing without removing the Spacers and face forms, washers are inserted between the Spacers and the top flange of both back and face forms.

Blaw Flexible Forms illustrated on page 33 are used at street intersections and other places where it is not practical to use Universal or Special Road Forms.

When the specifications require mechanical tamping, the usual procedure is to bolt the curb forms on top of the base forms, immediately after the tamping operations have been completed. In this case, Type C Special Road Forms are used at the bottom, and Universal Forms for the curb.

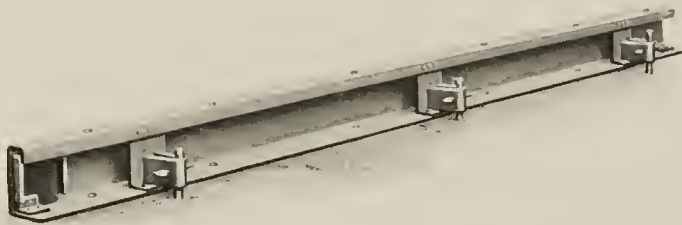


10 Ft. Section of Forms, Showing Universal Forms Bolted to Type C Special Road Forms, Carrying Blaw Face Forms

Blawforms for Roads and Streets



Type C Special Road Forms on Monolithic Brick Road at Painesville, Ohio



Note the Heavy Construction and Rigid Staking of Type C Forms

Speed of erection is one of the principal economical features of Blaw Special Road Forms.

Merely set each section of the forms to line horizontally, drive the stakes, then lift or depress to grade line, and lock the form in position by means of wedge-shaped keys.

Blawforms on Monolithic-Brick Roads

The monolithic-brick is the most modern type of brick road.

After the base has been poured and tamped, the brick face is laid on the green concrete, grouted, and rolled (or tamped by machine), thus assuming a monolithic character impervious to moisture.

Like the concrete road, the monolithic-brick road requires no curb.

Blaw Universal Forms, "without slots," or Special Road Forms of either type, are used with equally good results. The extra heavy Type C Special Road Forms are always required when the tamping (either of the base or of the brick, or both operations) is done mechanically.

The general practice is to use forms of the same height as the road, whether tamping is done by hand or by machine.

The use of Blaw Flexible and Radius Forms in road construction is explained on page 33.

Steel forms are usually required in specifications covering monolithic-brick roads.

Blaw Steel Forms insure better alignment and a smoother finish to the road surface—they represent a definite economy because they eliminate a large wood form bill which is the result of frequent replacement, and at the same time materially reduce labor costs by practically eliminating skilled labor.

The rigidity of Blawforms is an absolute assurance of true and smooth road surfaces.

There are no loose parts to become lost or get out of order, and all types are interchangeable.

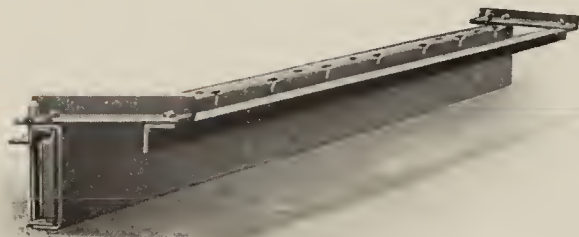
They are simple in design and construction, and can be set up by unskilled laborers in a fraction of the time and with a great deal less labor than required for ordinary forms.



Blawforms for Roads and Streets



Blaw Header Curbing Forms Casting Integral Base and Header Curbing
for Bituminous Surfaced Road



10 Ft. Section of Forms, Illustrating the Blaw
System for Bituminous Surfaced Concrete
Road Construction

For bituminous surfaced roads requiring no header curbing, Blaw Universal Forms "without slots" may be used.

However, either Type B or Type C Special Road Forms may be used.

Blawforms on Bituminous Surfaced Roads on Concrete Base

In the construction of bituminous surfaced roads on concrete base, it is necessary to provide a curb (commonly known as the "header curbing") integral with the base, for containing the surface course.

Blaw Header Curbing Forms consist of side forms of the Universal Type, or either type of Special Road Forms, from which steel Header Curbing Angles are suspended by means of the standard Blaw angle "Spacers," just like Blawforms for Sand Cushioned Brick Roads described on page 13. Type C Special Road Forms should be used when the subgrading or finishing is accomplished mechanically.

After the forms are in place, the concrete is poured, making base and header curbing at the same time.

Blaw Header Curbing Angles are made of $\frac{1}{4}$ " steel, either 2" x 2" or 2½" x 2", as the specifications may require the depth of the curbing. As they are punched in templets and are therefore interchangeable, they can be used in connection with the Blawforms you may now have.

See page 33 regarding Blaw Flexible and Radius Forms.

Because of the simplicity of design, Blaw Steel Forms for Bituminous Surfaced, and for Sand Cushioned Brick Road construction are easy to erect and take down; they are fool proof, and require only one form setter and one assistant to operate. A wooden form for the same purpose is extremely expensive to build and maintain, and calls for drift bolts, clamps, wood spreaders, and other appliances, which must be handled by expert carpenters continuously.

Blawforms, of any type, though heavy and sturdy, are light enough to be easily handled.

Their simple mechanical features insure the best results with minimum effort.

They will not warp, swell, or crack.

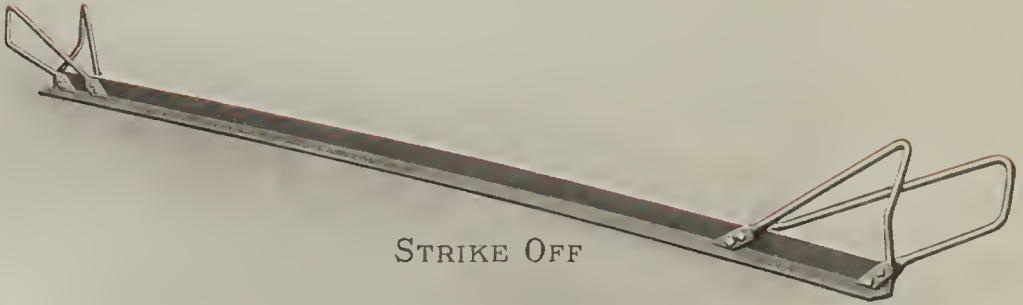
They are quickly and easily set up and taken down, because of the patented Slip-Joint Connection, and simple, positive system of staking. The Blaw Slip-Joint Connection is positive, quick-acting, and self-cleaning, and assures perfect alignment and absolute rigidity.



Blawforms for Roads and Streets



ROAD DIVIDING PLATE

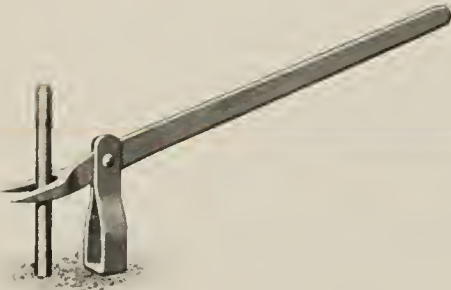


STRIKE OFF



ROAD BULKHEAD

Three Road Building Accessories that are Practically Indispensable



The Blaw Stake Puller, a Simple Yet Very
Effective Tool that Pays for Itself
Every Day it is Used

*The service and experience of the
Blawforms Engineers, acquired by inti-
mate contact with thousands upon thou-
sands of concrete construction projects,
are at your disposal, at all times, without
obligation to you.*

Road Building Accessories

BLAW ROAD BULKHEADS

Blaw Road Bulkheads are made of flat strips of $\frac{3}{8}$ " steel plate, 10" high, and $\frac{1}{2}$ " shorter than the width of the roads for which they are furnished.

2 $\frac{1}{2}$ " x 2" angles are riveted along the tops to facilitate handling.

At the end of a day's run, Blaw Road Bulkheads are indispensable.

Bulkheads of other sizes and types can be furnished.

BLAW ROAD DIVIDING PLATES

Blaw Road Dividing Plates are made of $\frac{3}{8}$ " steel plate, cut to the required road crown, with a hole punched in each end to facilitate removal. The standard Blaw Road Dividing Plate is 2" higher at the center than at the ends, and $\frac{1}{2}$ " shorter than the width of the road for which it is furnished. Other sizes and types can be furnished.

BLAW STRIKE-OFFS

The Blaw Strike-Off is made of a 4" x 4" x $\frac{3}{8}$ " steel angle, shaped to give the required crown to the road, and weighs approximately 8 lbs. per linear foot.

Horizontal and vertical forged steel handles are provided on each end.

These strike-offs are all two feet wider than the road for which they are furnished.

We can supply strike-offs in accordance with individual preferences.

THE BLAW STAKE PULLER

This is an ingenious little tool, small, compact, and easy to operate. It is built of a high grade tool steel, on the lever and fulcrum principle—the jaws will not wear away.

Its purpose is to expedite the pulling of stakes, and to prevent the abuse to which forms are usually subjected when sledgehammers, clawbars, and other makeshift methods are employed.

A Blaw Stake Puller will save your form setters from one to three hours per day.

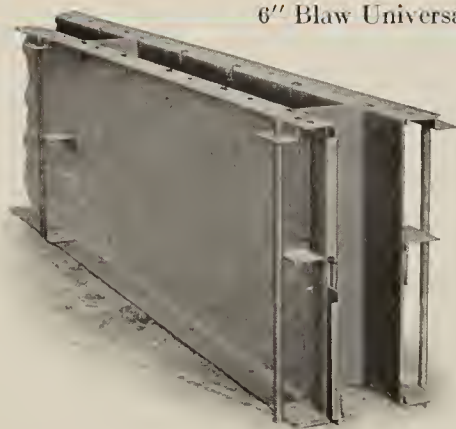
The Blaw Stake Puller should always be used in connection with Blawforms for Road and Street Construction.



Blawforms for Roads and Streets



6" Blaw Universal Forms Built Up for 18" Concrete Curb, Erie, Pa.



Part of a 10 Ft. Section of 24" Blaw Universal Forms Set Up for Straight Concrete Curb

The illustration above will convey to you some idea of the adaptability—the “universality”—of Blaw Universal Forms.

After finishing the 18" curb job, the contractor who purchased these 6" forms used them on quite a bit of road construction work.

The forms are still good for many years' service.

Concrete Curb Construction

In the construction of concrete curbs, the forms are made up either of a single Blaw Universal Form of the proper height, or of a number of Universal Forms bolted together, one on top of the other, to make the required height.

The same forms are used for *battered* concrete curbs, the batter being formed by the dividing plates, which can be furnished in any size and shape, as described on page 35.

Single Blaw Universal Forms 12" to 24" in height are used, as a rule, only in cases where the contractor specializes in the construction of one size of curb, or has an unusually large job on hand.

Single 24" forms are cheaper than a number of smaller ones bolted together to make the same height, but the latter can be used on many kinds of work—on certain types of roads, on sidewalks, gutters, combined curb and gutter, integral curb for concrete pavements, etc.—and will therefore prove more economical in the long run.

Slots are provided in the top flanges of all Universal Forms, so that expansion joints can be made wherever desired in curbs cast in Blawforms.

Dividing Plates of any cross section can be furnished, as illustrated on page 34.

Blaw Flexible Forms are used at street intersections, for making sharp curves, and where the radius changes frequently. Blaw Radius Forms are used where a constant repetition of the same radius is encountered. These two types of Blawforms are described and illustrated on pages 32 and 33.

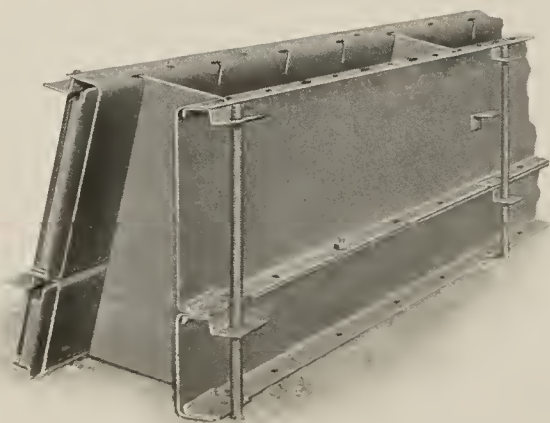
Radius Forms cannot be furnished for battered curb construction.



Blawforms for Roads and Streets



One 12" and Two 6" Blaw Universal Forms Built Up for 24" Concrete Curb Construction Troy, Ohio



Part of a 10 Ft. Section of Blaw Universal Forms
Set Up for 18" Battered Concrete Curb

We urgently recommend the use of Blaw Collapsible Dividing Plates for making the expansion joints in Battered Concrete Curbs 15" high and over.

These plates, which are described on pages 34 and 35, can be removed without disturbing the side forms—a procedure heretofore impossible in Battered Concrete Curb Construction.

Concrete Curb Construction (concluded)

Unless Blaw Collapsible Dividing Plates (see pages 34 and 35) are used on *battered* curbs, it is always necessary to remove the battered form first (before the dividing plates), because the ordinary dividing plate is wider at the bottom than at the top.

As the dividing plate must be removed before the concrete has set, it is often dangerous to take away one of the side forms, especially for curbing 15" high and over.

The Blaw Collapsible Dividing Plate for *battered* curbs can be removed without disturbing the side forms. The use of these plates is an insurance against distortion, bulging, or failure.

The advantages of Blawforms for concrete curb construction can be clearly seen. Any irregularity, bulging, or break in alignment in a curb rising 6" above the pavement can be quickly observed. Hence perfect alignment and true shape are imperative.

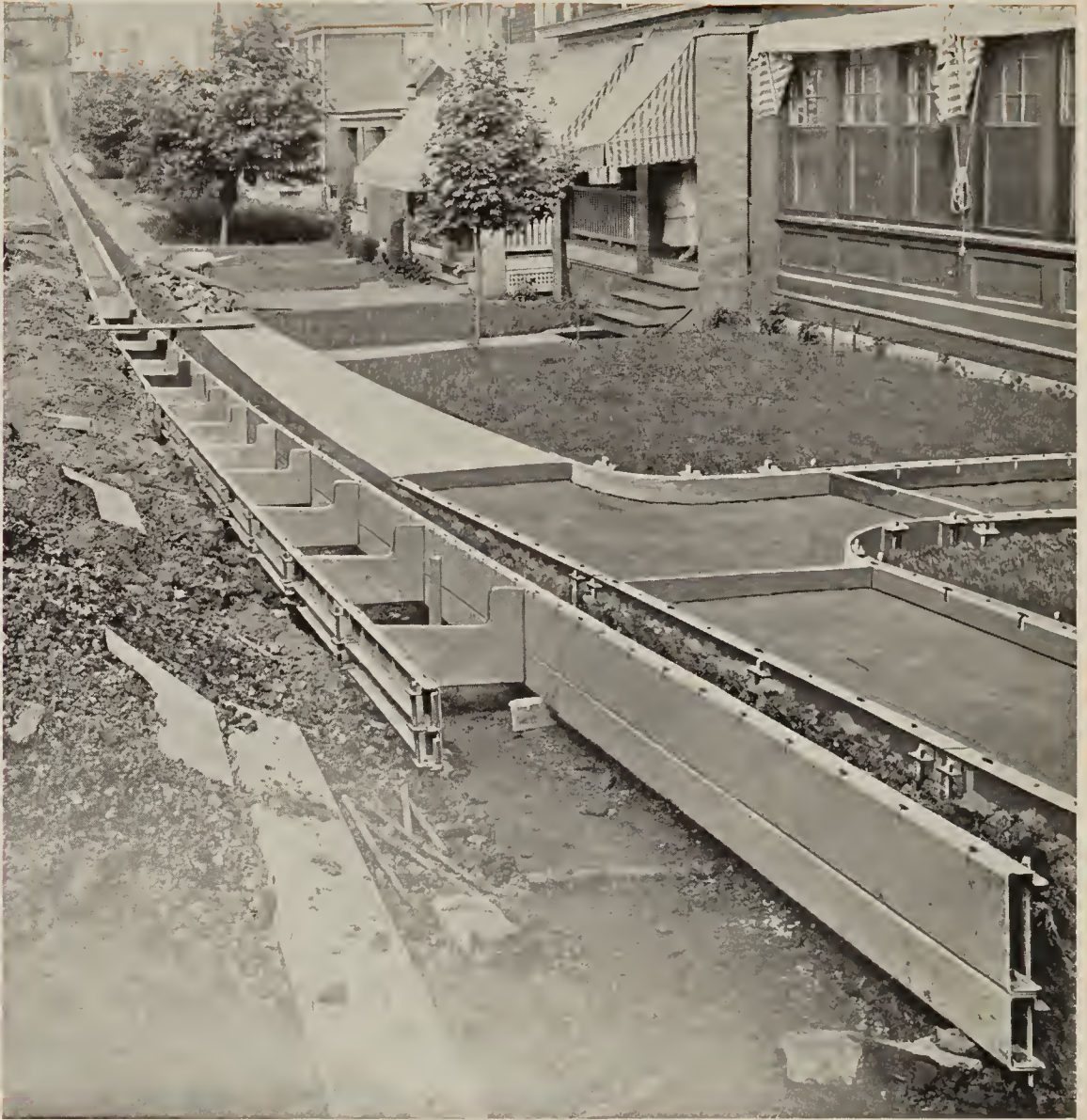
The Blaw System of locking adjacent forms by means of the patented Slip-Joint Connection automatically makes possible perfect alignment. The ingenious dividing plate, which provides for the expansion joint, also locks the opposite side forms together, and this insures a uniform and true width and shape of curb. This, together with the Blaw System of staking the forms, absolutely prevents bulging or failure.

These mechanical features make unnecessary the expensive bracing, the use of spreaders and clamps, the cumbersome staking and more burdensome tearing down of the forms, which are necessary when wood forms are used.

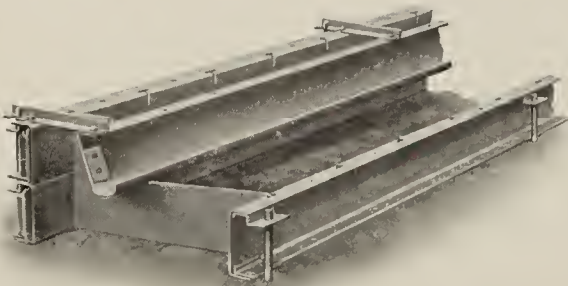
Wood forms therefore cost more to handle. This saving in labor cost will, on one good sized job, pay for the investment in Blawforms. Blawforms can be used over and over again indefinitely, and for all types of road and street work.



Blawforms for Roads and Streets



Blaw Universal Forms Used in Building Combined Curb and Gutter, also Sidewalks. Dormont, Pa.



Part of a 10 Ft. Section of 6" Blaw Universal Forms, with Blaw Steel Face Form, Set Up for Combined Concrete Curb and Gutter

When the Blaw System is used, the construction of combined Concrete Curb and Gutter becomes very simple, and, consequently, most economical.

The Dividing Plates, which make this possible, are inexpensive and can be furnished in any desired cross section. See pages 34 and 35.

Combined Concrete Curb and Gutter Construction

For combined concrete curb and gutter construction, Blaw Universal Forms are used—the same forms that are also used for curb, gutter, sidewalk, pavement, and certain types of road construction.

The back of the curb is made up either of a single Universal Form, or of two or more Universal Forms bolted together, one on top of the other.

A single Universal Form is used for the gutter, the front face of the curb being formed either by a wood, or by a Universal Form or a Blaw Steel Face Form.

The wood face form is held in position by means of clamps. We do not furnish wood face forms, nor the clamps which are of standard design and can be purchased in any hardware store or supply house.

Blaw special steel Face Forms, instead of wood, are strongly recommended as they eliminate the necessity of refinishing or rubbing. This operation is, as a rule, an expensive item, calling for skilled workmen who are frequently unobtainable.

Besides, municipal engineers are realizing the vital importance of doing away with this refinishing, because the face of the curb will peel and crack, due to poor workmanship and frost action.

Blaw Steel Face Forms, of any design or shape, can be furnished. No special clamps are necessary; the standard Blaw angle Spacer, described on page 13, is used to suspend the face form from the back of the curb forms.

Expansion joints in the concrete are taken care of by Blaw Dividing Plates, which can be furnished in any size and shape, as described on page 35. These Dividing Plates (which are removed before the rails forming the back of the curb and the front of the gutter) serve not only as templets to strike off and finish the curb and gutter, but also to space the face form of the curb.

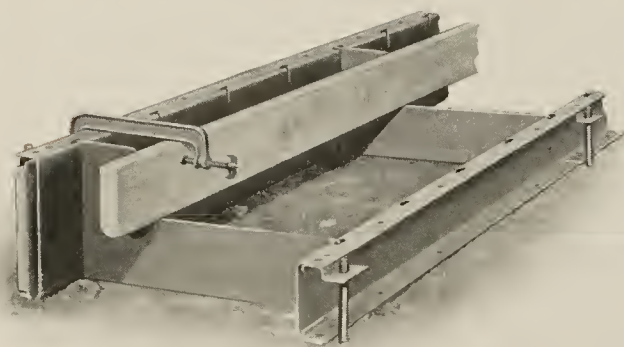
The top flange of every Universal Form is slotted every 12", and expansion joints can be made wherever desired.



Blawforms for Roads and Streets



Blaw Universal Forms on Combined Concrete Curb and Gutter Construction. Rochester, N. Y.



Part of a 10 Ft. Section of 12" and 6" Blaw Universal Forms, with Wooden Face Form, Set Up for Combined Concrete Curb and Gutter

Blaw Steel Face Forms will, in the long run, always be found more economical than wood, and can be furnished for any style of curb face.

The two most modern shapes are indicated by Dividing Plate Types Nos. 2 and 3, on page 34.

Combined Concrete Curb and Gutter Construction (concluded)

For making sharp curves, at street intersections, and wherever the radius changes frequently, Blaw Flexible Forms should be used. Blaw Radius Forms are recommended where a constant repetition of the same radius is encountered. These forms are illustrated on pages 32 and 33.

It is not practical to use Flexible or Radius Forms as a face form for the curb, in the construction of combined curb and gutter.

For combined curb and gutter construction, the fine results obtained at low labor cost make Blaw Steel Forms an indispensable part of the wide awake contractor's equipment.

Blawforms, jointly used with Blaw Dividing Plates, make measurements of any kind unnecessary. No skilled workmen are required. The dividing plates lock the back forms and gutter forms together, assuring a uniform and true curb and gutter.

In operation the back form is set to line and grade, and automatically the line and grade and shape of the curb and gutter is established.

The labor saving is evident, and the good work resulting is gratifying to the conscientious contractor and engineer.

Concrete Gutter Construction

Concrete gutters are built in parks, in residential districts, and for hillside drainage.

The shape of the gutter varies frequently, but Blaw Universal Forms are used on all types.

We manufacture a special Gutter Dividing Plate to make the expansion joint and, at the same time, to serve as a template to shape the gutter, as illustrated at the right.



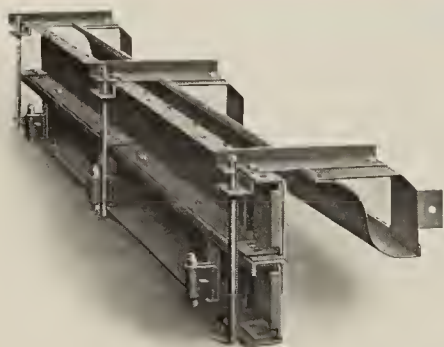
10 Ft. Section of Blaw Universal Forms Set Up for Concrete Gutter Construction



Blawforms for Roads and Streets



Concrete Curb and Pavement Built Integral. The Most Modern Pavement for Residential Districts



10 Ft. Section of Blawforms for
Building Curb and Pavement
Integral

Blaw Steel Face Forms are indispensable in this type of construction, particularly when the specifications require that the face of the curb be curved.

They obviate the use of special, cumbersome, extremely expensive, and impracticable wooden forms.

Building Integral Curb for Concrete Pavement

Integral Curb for Concrete Pavements is a recent development of concrete pavement construction. This type of construction saves at least 50% of the cost of building curb or curb and gutter. There is a considerable saving in time, as curb and pavement are poured simultaneously.

Blaw Universal, or Blaw Special Road Forms of either type, are easily adapted to this type of construction. As illustrated on the opposite page, also described in the discussion of the construction of integral curb and base for Sand Cushioned Brick Roads (page 13), the back form is first set to line and grade and the special Blaw Face Form is then suspended by means of the Blaw angle Spacer—no stakes or braces are necessary.

Where the pavement is mechanically finished or is finished by belt, the back form is built up of two sections, generally 6" each. The bottom form, which should be a Special Road Form, is set to line and grade, the pavement is poured and finished, then the curb form (a Universal Form) is bolted on, the face form is suspended in the usual manner by means of the Spacers, and the curb is then poured.

The setting up of the curb forms by the Blaw Method is an extremely simple operation. And especially when the recommended curved face is to be built, the indispensability of Blawforms becomes apparent. The saving in labor is definite and often considerable.

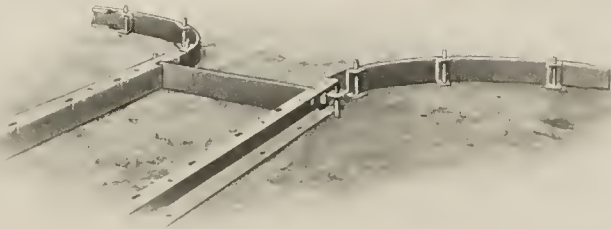
The Blaw System really makes possible the satisfactory construction of Integral Curb for Concrete Pavements, and obviates the use of the special, cumbersome, extremely expensive, and impracticable wood forms heretofore required.



Blawforms for Roads and Streets



4" Blaw Universal Forms Used in Concrete Sidewalk Construction. Pittsburg, Kansas



Blawforms Set Up for Concrete Sidewalk,
Ready for Concreting

In the illustration at the left, note the Blaw Sidewalk Radius Corners and method of using. At least one set of these Corners should be found in every sidewalk builder's equipment.

Dividing Plates of any width can be furnished at a nominal price.

Concrete Sidewalk Construction

For building concrete sidewalks, Blaw Universal Forms, described in detail on page 7, are used.

When the contractor's activities are confined to sidewalk construction, an equipment of 4" forms will prove the most economical. In some localities 5" sidewalks are built; in this case either 1 x 4's are bolted to the bottom flanges of the 4" Universal Forms (bolt holes being provided for the purpose), or 5" Universal Forms are used.

Sidewalks can be made in any desired width, with expansion joints as little as 12" apart. (See pages 34 and 35 regarding dividing plates). The average and most frequently met with sidewalk widths are 4 ft. and 5 ft.

Blawforms for sidewalks have proven very economical because they eliminate the ever increasing wood form bill.

Wood forms are a constant expense; they are easily lost, and frequently stolen. They must be replaced as soon as they warp or swell or wear. They can be re-used only a limited number of times.

Blawforms on the other hand represent *an investment in permanent equipment*. They last for years with ordinary care. Blawforms will not warp, swell nor lose their shape. They stay straight and insure perfect alignment at small expense and effort.

Blaw Sidewalk Radius Corners

The sidewalk Radius Corner is a simple, flexible form, that (unlike Blaw Flexible and Radius Forms) connects directly to the Universal Forms, being set up at the same time. It is only used for sidewalk curves.

This form is furnished in three heights only; namely, 4", 5", and 6", for either 18" or 24" radius.

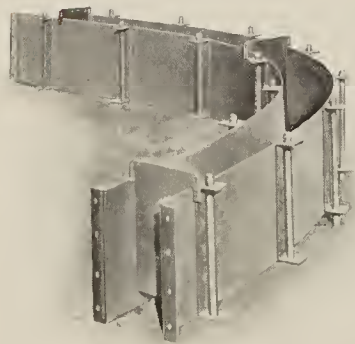
For larger radii, and where a constant repetition of the same radius is encountered, Blaw Flexible and Blaw Radius Forms, respectively, should be used.



Blawforms for Roads and Streets

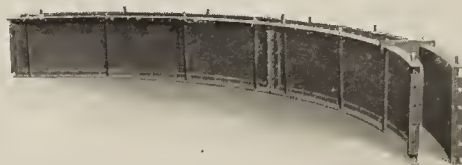


For Curved Work of this Character either Blaw Flexible or Radius Forms Should be Used



Blaw Flexible Forms Set Up for
Casting a Concrete Curb Corner

*There is not one type of road or street work on
which Flexible or Radius Forms will not prove
money savers, at one time or another.*



Blaw Radius Forms Set Up for Casting a
Concrete Curb Corner

Blaw Flexible and Radius Forms

To build corners for street intersections, driveways, curbs, combined curb and gutter, sidewalks, or roads where the alignment changes frequently, Blaw Flexible or Blaw Radius Forms are used.

Blaw Flexible Forms are made from single pieces of special steel, and will always spring back to the flat position when released from the form.

They are furnished in all standard lengths and heights.

The stake clips, which are never spaced more than 18" apart, are riveted to the forms, one steel stake of the proper length being furnished for each set of clips. Drilled angle irons are riveted to the ends; any number of forms can be bolted together, end to end, so that any length and shape of form can be made up. They cannot, however, be bolted together one on top of the other.

The Flexible, as also the Radius Forms illustrated on the opposite page, are set up for the construction of a concrete curb corner. Note the dividing plates and method of inserting.

Blaw Radius Forms are used where a constant repetition of the same radius is encountered.

They can be furnished in all standard lengths and heights.

Blaw Radius Forms are made from single sheets of special steel, reinforced on top and bottom edges with angle irons which are rolled to the proper radius and riveted thereto.

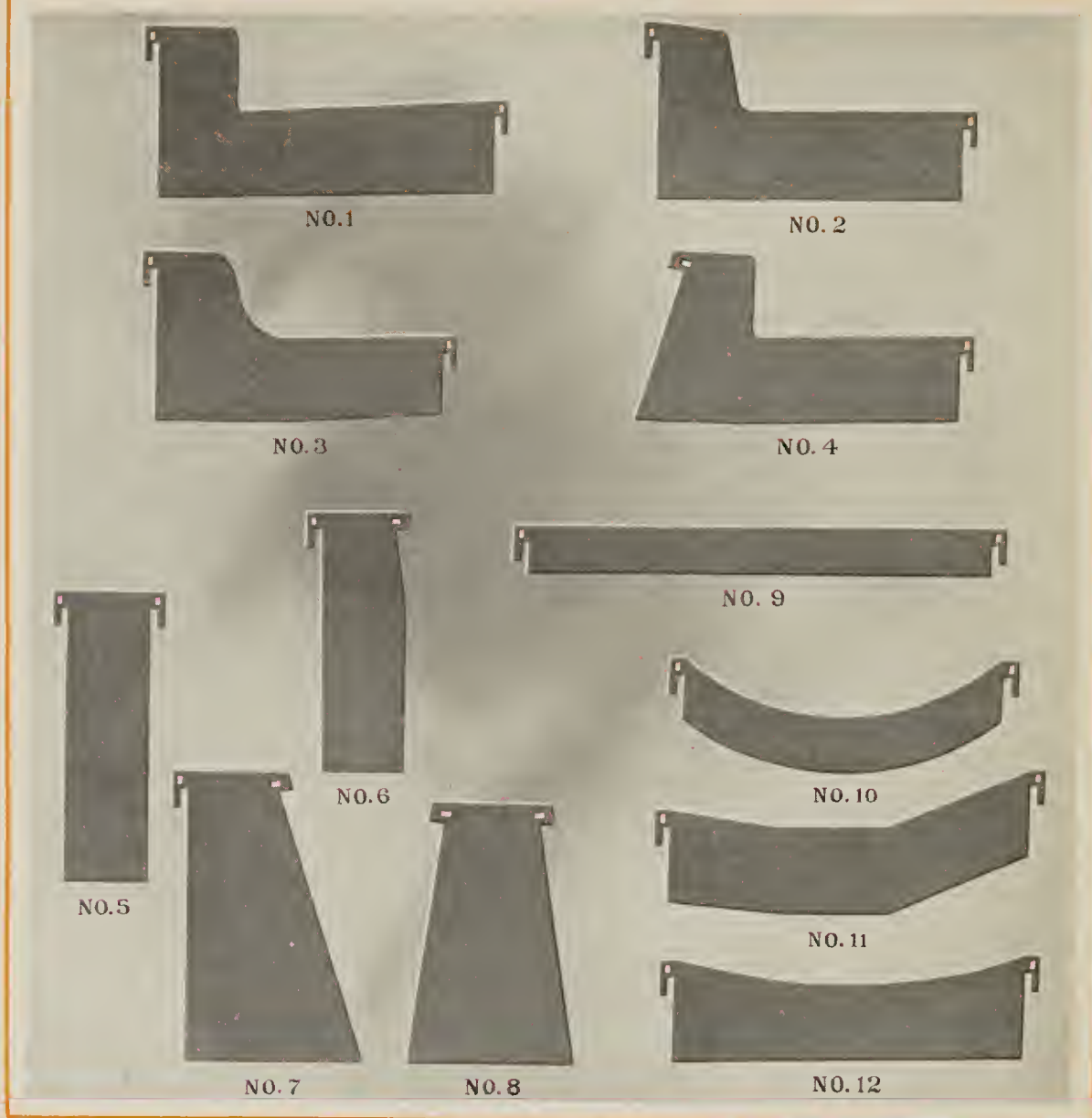
They are also reinforced with angle irons at both ends. This makes a permanent, rigid form which cannot be used on any other radius except that for which it is furnished.

The top and bottom angles are drilled to accommodate the stakes which are furnished for holding the form in the proper position.

Blaw Flexible and Radius Forms can be used in connection with Blaw Universal or either type of Special Road Forms for building curbs, gutters, combined curb and gutter, sidewalk, and the various types of road construction.



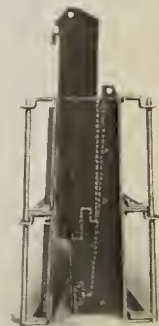
Blowforms for Roads and Streets



Various Types of Blow Dividing Plates



A Blow Collapsible Dividing Plate for Battered Concrete Curb Construction, in position in the forms, is shown in the center of the illustration at the left, the two parts of which it is composed being shown on either side of the form.



The illustration at the right shows the operation—the dotted lines indicating how it is possible to remove both parts of the plate without disturbing the side forms.

Blaw Dividing Plates

Blaw Dividing Plates are made of high carbon steel plate, $\frac{3}{16}$ " thick, the standard thickness of expansion joint adopted by engineers all over the country.

They can be furnished in any desired cross section, for every type of sidewalk, curb, curb and gutter, integral curb and base, and road construction. The types illustrated on the opposite page are those in common usage; we are prepared to furnish special sizes and types.

The projections which are die cut on the ends of the Dividing Plates serve not only to hold the plates in position, but also to space the side forms the proper distance apart. There are no wedges or complicated arrangements—they fit snugly in the slots provided in the Universal Forms, and will not wobble. No stiffening bars are needed to hold them straight while tamping.

The Dividing Plates do not project above the side forms, and therefore do not interfere with finishing operations.

After the concrete has had its initial set, hooks are inserted in the holes at the top corners of the Dividing Plates, which are then withdrawn, leaving a clean cut expansion joint. Two of these hooks are supplied with all orders for dividing plates.

Dividing plates should always be removed before the side forms, which allows for the better and proper finishing of the expansion joints.

For *battered* concrete curb construction (which heretofore required the removal of one of the side forms before the dividing plates, which are wider at the bottom than at the top, could be removed), we have developed the patented Blaw Collapsible Dividing Plate, which can be removed before the side forms.

The use of the Blaw Collapsible Dividing Plate is urgently recommended, particularly on battered curbs 15" high and over. The removal of side forms before the dividing plates on such curbs is fraught with danger, and often results in distortion, poor alignment, bulging, or complete failure.

The dividing plate slots in Universal Forms, and the application of Blaw Dividing Plates are clearly shown in the illustration at the right.

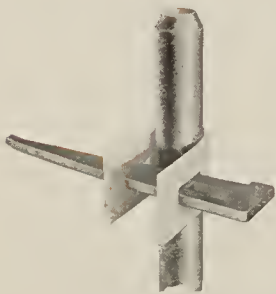


Blawforms for Roads and Streets

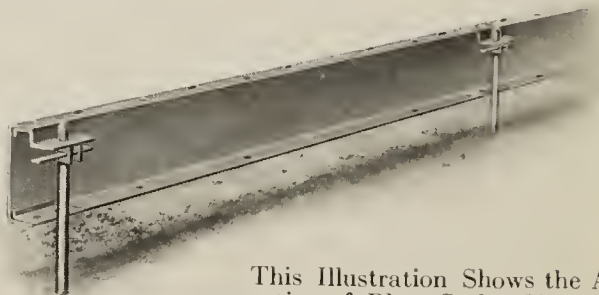


Blaw Universal Forms "Without Slots" on the Dixie Highway Monolithic Brick Road

The Blaw System of staking eliminates expensive bracing, troublesome nailing, and stripping wooden stakes away from wooden forms.



Blaw Stake Clamp in Position. Note its Simple Construction, and its Positive Grip on the Stake



This Illustration Shows the Application of Blaw Stake Clamps and Stakes to a Universal Form Where the Grade is Low

Blaw Steel Stakes

Blaw Steel Stakes are used to line up and hold securely in position, all types of Blawforms for Road and Street Construction.

They prevent the forms from shifting when the concrete is being poured, tamped and finished.

One steel stake of the proper length is furnished for each stake clip or stake strap, the quantity being governed by the length and type of form. Stakes 18" long are usually furnished with all Blaw Special Road Forms. Longer stakes can be furnished if required, particularly for use in soft ground.

For Universal Forms, stakes 18" long are included with forms up to 10" high; for 12" and 15" forms, the stakes are 24" long; 30" long for 18" forms, and 36" long for 20" and 24" forms.

Blaw Stakes are made of high carbon steel, $\frac{7}{8}$ " in diameter, with one end sharpened to facilitate driving, the other end being beveled to prevent brooming. They hold securely in soft ground, and are a necessity in hard ground through which wood stakes could not penetrate. List prices of Blawforms for Roads and Streets always include the necessary stakes. Additional, or extra long stakes, can be furnished at a nominal price.

In operation, the Blawform is set in position directly against the guide line, and a steel stake is inserted in the stake clip or strap; a few blows, and the form is securely staked and held in position. For exact grade the form is moved up or down along the stake as required; a little dirt or a stone holds the form to required grade. For Universal Forms the Blaw Stake Clamps can be used to suspend to grade. For the Special Road Forms the Blaw Wedges automatically set and hold the forms to grade.

Blaw Stake Clamps

Blaw Stake Clamps are used for holding Universal Forms at the proper elevation where the work is being done on uneven ground, or the grade is low. They are composed of slotted and bent steel straps, with tapered keys, as illustrated on the opposite page.

These clamps are simple, and easily and quickly operated.

Blaw Stake Pullers

The Blaw Stake Puller illustrated and described on pages 18 and 19 should always be used in connection with Blawforms for Road and Street Construction.

It is a simple, sturdy little device, that will save your form setters from one to three hours per day.



What Users Think of Blawforms*

"In reply to your recent letter wish to say your forms are perfectly satisfactory in every respect.

"We wish to say that you are the only people in the road equipment business that deliver goods when agreed."

"We have used your Blaw Special Road Forms and find them to be all that you claim, and you can be assured that we will call upon you when in the market again."

"Replying to your letter relative to the satisfaction given by your Blaw Special Road Forms which are being used on this contract, will say that they have proven most satisfactory in every respect.

"The only trouble having been encountered by us has been in removing the stakes from hard earth without the Stake Puller which we later learned you furnish."

"In answer to your letter of recent date we beg to inform you that we are not using a tamping and finishing machine on our contract as yet, but in every respect the Special Road Forms have proven highly satisfactory."

"We cannot speak too highly of these forms, for in some instances we have put them to severe tests, and in each case they stood the test in every respect.

"Besides being a great improvement over the old style wooden forms, they are easier handled in setting, and also in removing same from the cured pavement.

"We are always sure of no hold up in our work on account of same sagging, breaking, or having any other numerous mishaps which are customary with the wooden form proposition.

"Since having these forms on the job, we would not think of using others."

**Names and addresses furnished on request.*



What Users Think of Blawforms*

"Your steel forms for 18-inch concrete curb have proved satisfactory in every respect.

"The 18-inch curb made up of one rail, is preferable for the contractor who has a great amount of 18-inch curb to lay, but for the one who has only a small amount, I think your scheme of bolting three 6-inch rails is better, as 6-inch rails can be used for sidewalk, curb, and curb and gutter work of other sizes.

"Again, forms built up of two or three 6-inch rails bolted together are well adapted for city contract work, where one is liable, as here, to meet rock or gas pipes, where he can put sometimes only a 6-inch or 12-inch form."

"Since receiving your Curb and Gutter Forms in July, we have used them almost continuously. They have proved to be just what we have been looking for. They are easy to set up and easy to remove when curb and gutter have been made. By taking the Curb and Gutter Forms apart and using the Sidewalk Dividing Plates, we have an excellent set of sidewalk forms.

"The forms now are in as good condition as when received, thus showing us the durability of steel forms. Under the present outlook, we expect to make another order for Curb and Gutter Forms of you before the next season opens."

"We have been using your steel sidewalk forms for two years and find them to be all that you claim. It is no trouble to keep a walk in line and grade, and they can be set up in about one-fourth the time required to set and stake wooden forms.

"Clean cut expansion joints are much better and more sightly than joints of cardboard or paper required with the wooden forms, and can be made in a great deal less time.

"We consider the cost of form setting about one-fourth that of wooden forms, and our steel forms, after two years, show no appreciable wear."

**Names and addresses furnished on request.*



Blawforms for Culverts



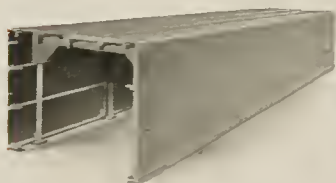
Blaw steel Culvert Forms meet the standards of practically every active road building state in the union.

The Blaw Adjustable Box Culvert Form is truly adjustable as well as collapsible, and can be furnished for making any one size or any range of sizes of culverts from 2' x 3' to 10' x 12'.

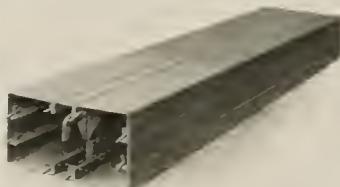
For small culverts, the forms for which must be mechanically collapsed from the outside after the concrete has set, we have developed two types of Blaw Small Culvert Forms for culverts 12" x 18" up to 24" x 24".

Our engineers will, at your request, be pleased to recommend the most economical equipment for your requirements.

Write for literature and data.



10 Ft. Section of Blaw Adjustable Box Culvert Form



10 Ft. Section of Blaw Small Culvert Form, Type A



10 Ft. Section of Blaw Small Culvert Form, Type B



Blaw Mixing Boxes



The Blaw Mixing Box is Made Entirely of Steel, and Will Not Leak. The Inside Surface is Absolutely Smooth, and there are no Rivets nor Bolts Protruding

Wherever used, the Blaw steel Mixing Box quickly becomes a very valuable part of the contractor's regular equipment.

It is light and easily transported from job to job (it just fits into an ordinary wagon or truck bed) yet is very solid and dependable.

Its cost is not much more (if any) than the cost of a good wooden mixing box: yet one steel box will outlast ten or twelve wooden boxes. It is made of No. 14 gauge steel plate, and weighs but 160 pounds.

Consider first its small cost, then the actual saving in time, labor and lumber. You can readily see that a Blaw steel Mixing Box will pay for itself in a very short time.

Quality and service govern the construction of the Blaw steel Mixing Box. It is 9' long, 3' 3" wide and 9" high. This size was determined upon only after a most searching examination into the contractors' needs.

The wide flange around the top, combined with its light weight (two men can very easily carry it) make very easy handling.

The convenience of having such a mixing box *instantly available for every job you undertake* should surely appeal to you.

The sides are vertical and the ends sloping, which, with the rounded edges at the bottom, makes shoveling and mixing very easy.

It is very easily cleaned, and is so strongly constructed that it will stand the hardest kind of service for years.



Blawforms in General



Blaw Light Wall Forms Being Used in Building the Concrete Foundations for an Industrial Village of 1000 Houses

From sewers to subways, from sidewalks to skyscrapers, there are Blawforms for every type of concrete construction.

Ever since their introduction, Blawforms have been used on every noteworthy engineering project: the Panama Canal, New York State Barge Canal, New York Aqueduct, Winnipeg Aqueduct, Calumet-Sag Channel, the sewer systems of our large cities, etc., and for general concrete construction, by all the leading industrial plants, railroads, engineers and contractors.

Just remember that there are Blawforms for *every* type of concrete construction! And while it is not economically practicable to use steel forms on *all* jobs, yet there are *very few* on which our engineers cannot show you, in black and white, a very material saving in time, labor and money.

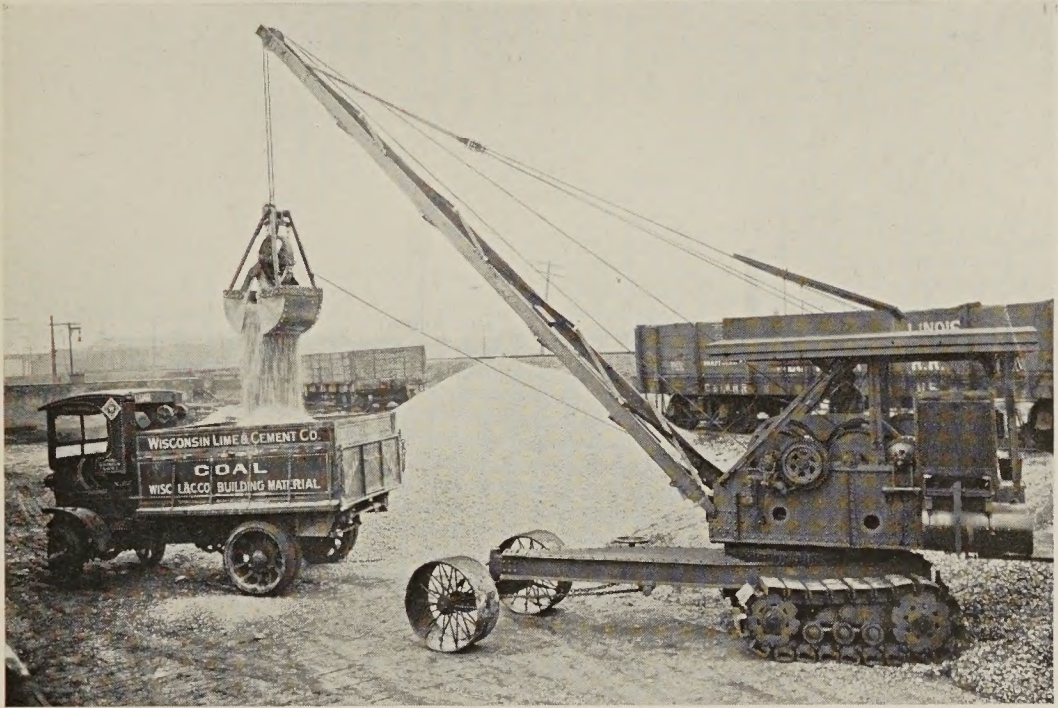
If you have any work on hand, or are bidding on a job, send us the details (blue prints also, if you have them), and we will promptly and frankly tell you whether or not Blawforms will save you money.

The Blawforms Engineers are all practical men, recruited from the field—their service and experience, acquired by intimate contact with thousands upon thousands of projects, are at your disposal, at all times, without obligation to you.

Write for the Blawforms Book—it contains 128 pages of illustrations and data of vital interest.



The Blaw Power-Wheel Bucket



Blaw Power-Wheel Bucket Handling Road Building Materials

The Power-Wheel is a light but extremely powerful all around bucket, particularly adapted to road building work.

In ordinary buckets of this type the "bull wheel" is mounted on the main hinge pin, in which position it rests on the material when the scoops are wide open, holding the bucket off the pile and, when partially closed, seriously interfering with the picking up of a reasonably sized load.

These defects are overcome in the Blaw Power-Wheel Bucket by mounting the wheel above the axis of the main hinge. This arrangement keeps the wheel well out of the material being handled, enables the bucket to open out wider than is commonly possible in buckets of this kind, and permits the use of a larger power wheel.

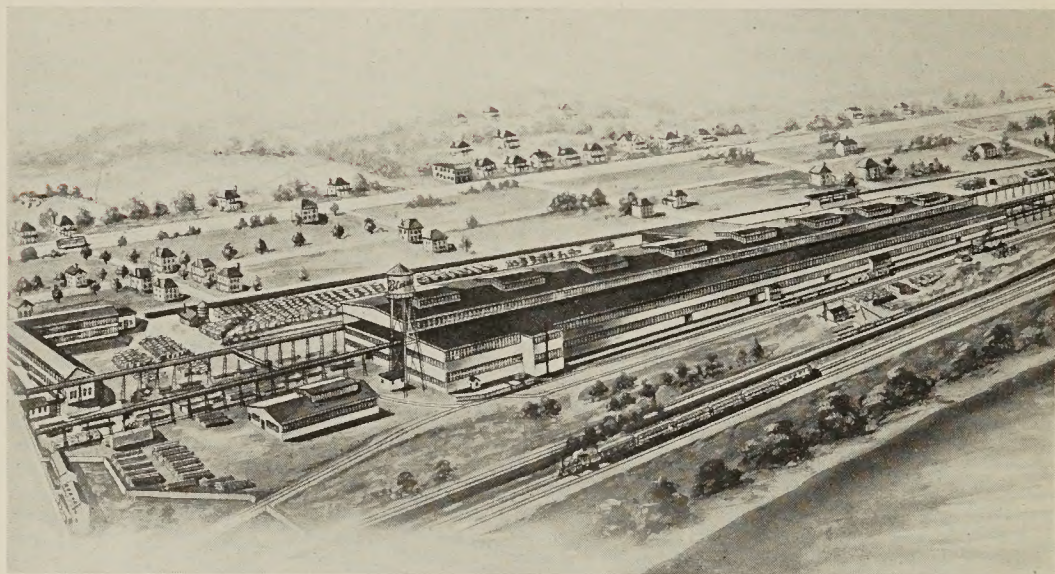
Write for literature and prices.

Blaw-Knox Company manufactures clamshell buckets for every kind of service in which clamshells can be used with economy. On receipt of information regarding your work we will gladly send full descriptive matter on the Blaw Bucket which meets your particular requirements.



Blawforms for Roads and Streets

Products of the Blaw-Knox Company



Home of Blaw-Knox Products, which has been Quadrupled in Size Since
this View was Made

FABRICATED STEEL

Fabricated steel, one of the principal products of Blaw-Knox Company, includes mill buildings, manufacturing plants, standardized sectional steel buildings, bridges, crane runways, trusses and other construction of a highly fabricated nature.

A corps of highly trained engineers is maintained for consulting and designing services.

TRANSMISSION TOWERS

Four legged straight line or suspension towers, anchor and dead end towers, latticed and channel A-frames, river crossing towers, outdoor substations, switching stations, signal towers, steel poles, derrick towers.

We specialize in the design and fabrication of high tension transmission lines.

PLATE WORK

Riveted, pressed and welded steel plate products of every description, including: accumulators; agitators; water boshes; annealing boxes; containers; digesters; filters; flumes; gear guards; kettles; ladles; pans; penstocks; air receivers; stacks; standpipes; miscellaneous tanks; miscellaneous blast furnace work; etc.

BLAW BUCKETS

Clamshell buckets and automatic cableway plants for digging and rehandling earth; sand; gravel; coal; ore; limestone; tin scrap; slag; cinders; fertilizers; rock products; etc..

For installation on derricks; overhead and locomotive cranes; monorails; dredges; steam shovels; ditchers; cableways; ships for handling cargo and coal; etc.

BLAWFORMS

Steel forms for every type of concrete construction: aqueducts; bridges; cisterns; columns; culverts; curbs and gutters; dams; factories; floors; foundations; houses; locks; manholes; piers; pipe; reservoirs; roads; sewers; shafts; sidewalks; subways; tanks; tunnels; viaducts; retaining walls; warehouses; etc.

FURNACE APPLIANCES

Knox patented water cooled doors, door frames, front and back wall coolers, ports, reversing valves, etc., for Open Hearth, Glass, and Copper Furnaces; water cooled standings, shields, boshes, etc., for Sheet and Tin Mills.



